

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference P 2002 00846 WO		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DK 03/00553	International filing date (day/month/year) 22.08.2003	Priority date (day/month/year) 22.08.2002	
International Patent Classification (IPC) or both national classification and IPC G09F19/22			
Applicant Z-COMPANY APS			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:
 - ☒ Basis of the opinion
 - ☐ Priority
 - ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Lack of unity of invention
 - ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Certain documents cited
 - ☐ Certain defects in the international application
 - ☐ Certain observations on the international application

Date of submission of the demand 04.03.2004	Date of completion of this report 27.07.2004
Name and mailing address of the International Preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Whittington, J Telephone No. +49 89 2399-2781 

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International application No. **PCT/DK 03/00553**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1, 4-14 as originally filed
2, 2a, 3 filed with telefax on 15.07.2004

Claims, Numbers

1-16 filed with telefax on 15.07.2004

Drawings, Sheets

1/9-9/9 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-16
	No: Claims	
Inventive step (IS)	Yes: Claims	1-16
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-16
	No: Claims	

2. Citations and explanations

see separate sheet

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Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1). Reference is made to the following documents:

- D1: DE 199 37 037 A (APA ADEL FANG & PARBEL GMBH & C) 15 February 2001 (2001-02-15)
- D2: WO 98/43231 A (THOMSEN ERIK BROGAARD ; LOGO PAINT (DK)) 1 October 1998 (1998-10-01)
- D3: EP-A-0 810 780 (MARKET SP 94 S L) 3 December 1997 (1997-12-03)
- D4: EP-A-1 193 667 (MARKET SP 94 S L) 3 April 2002 (2002-04-03)
- D5: US-A-3 631 619 (CAMPBELL JOSEPH R) 4 January 1972 (1972-01-04)
- D6: WO 93/04559 A (RICHTMAN JOSEPH MICHAEL) 4 March 1993 (1993-03-04)

2). This application concerns 3 dimensional imaging on 2 dimensional substrates for the purpose of public display and advertising.

2.1). Claims 1 and 7

The object of the technique as claimed in independent claims 1 and 7 is to create the illusion to the viewer of a 2 dimensional print that the image thereon has 3 dimensional properties. This is achieved by the inventive features whereby perspective image projections are constructed within the display which have two different fictive viewpoints. Two sides of the image are given two slightly different projection angles which correspond to the parallax spacing of the human eyes. In this way the human observer, viewing the 2 dimensional display from two slightly different perspectives, is provided with the more effective illusion of a 3 dimensional image. This, in turn, heightens the effect of the displayed image to the observer.

2.2). Claim 16 pertains to a computer program for carrying out the inventive method steps of claim 7, and as such is also inventive.

2.3). Of the two acknowledged prior art documents of the ISR, D1 describes a curved display for extended viewing angles, and D2 describes a perspective representation of a 3-D image on a 2-D substrate, but where the projection is viewed from only one, oblique angle. D3 describes a technique for corrected viewing of a poster using an

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image capturing camera. D4 and D6 describe a method for producing virtual billboards/images via a blended image from a TV camera. D5 describes a visually elongated sign for mounting above traffic. None of the cited prior art documents describe or suggest perspective image projections constructed within a 2-D display which have two different fictive viewpoints.

camera whose line of sight corresponds to the line of sight used in transforming the image to its inverse perspective form. Further, if a person looks directly at the inverse perspective transformation, the viewer will not be able to intercept the perspective transformation because the inverse

5 transformation has been performed according to a single viewpoint, where a viewer has two eyes and thereby two viewpoints. Especially when the viewer is close to the inverse perspective transformation this is a problem and the invention is therefore mainly useable in sports arenas where the viewpoint is a camera, which is placed with a long distance to the inverse perspective

10 transformation.

In DE 199 37 037 and WO 98 43231 other techniques has been described where prints are obtained which provides the illusion of being three dimensional because of perspective transformation. The techniques are

15 based in a single viewpoint and for the illusion to be convincing it requires that a single viewpoint is used such as a camera.

OBJECT AND SUMMARY OF THE INVENTION

It is an object of the invention to provide an advertisement print solving the

20 above-mentioned problem.

This is obtained by an advertisement print being printed on a print carrier, said print illustrates a transformation of a three-dimensional element, where said print is optimised for a viewer simultaneously using two viewpoints, a

25 first viewpoint and a second viewpoint being placed on each side of a central fictive viewpoint. The print comprises:

- a right side being a perspective projection of said three-dimensional element to said print carrier, said projection being optimised to said first viewpoint and

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- a left side being a perspective projection of said three-dimensional element to said print carrier, said projection being optimised to said second viewpoint.
- 5 Thereby a print is obtained providing the illusion of a three-dimensional element for a viewer having two viewpoints a left and a right eye. It is not necessary that the advertisement print is being viewed via a camera, now the viewer can look directly at the advertisement print at a close range (typically 2→20m) and get the illusion that he/she looks at a three-dimensional
- 10 element. The invention can thereby advantageously be used for advertisement in places such as supermarkets, exhibitions etc.

In a specific embodiment, the first viewpoint is placed on the right side of said central fictive viewpoint and said second viewpoint is placed on the left side of said central fictive viewpoint. By using the left eye for projecting the right side of the three-dimensional element and by using the right eye for
5 projecting the left side of the three-dimensional element, tests have shown that an advertisement print is obtained which gives a very good illusion.

In an embodiment, the print carrier is a removable mat. Thereby the image can easily be removed and e.g. replaced by another mat. Further, the image
10 can be produced at a first production place and then placed at a surface afterwards. The surface could be a plane surface, such as a ceiling, a floor or a wall.

In another embodiment, a projector pointing towards the print carrier provides
15 said print. Thereby the image can easily be applied and changed. The image could e.g. be changed continuously whereby the image or part of it can present a three-dimensional animation e.g. a flashing price tag, a "buy now" or a spinning bottle.

20 The invention further relates to a method of generating an advertisement print on a print carrier, said print being a transformation of a three-dimensional element, where said transformation is optimised for a viewer simultaneously using two viewpoints, a first viewpoint and a second viewpoint being placed on the each side of said central fictive viewpoint, the method
25 comprises the steps of:

- performing a perspective projection of the three-dimensional element to said print carrier according to said central fictive viewpoint,
- adjusting a right part of said perspective projection according to said first viewpoint,
- 30 - adjusting a left part of said perspective projection according to said second viewpoint.

CLAIMS

1. An advertisement print being printed on a print carrier, said print illustrates a transformation of a three-dimensional element, where said print is optimised for a viewer simultaneously using two viewpoints, a first viewpoint and a second viewpoint being placed on each side of a central fictive viewpoint, the print comprises:
- a right side being a perspective projection of said three-dimensional element to said print carrier, said projection being optimised to said first viewpoint and
 - a left side being a perspective projection of said three-dimensional element to said print carrier, said projection being optimised to said second viewpoint.
2. An advertisement print according to claim 1, wherein said first viewpoint is placed on the right side of said central fictive viewpoint and wherein said second viewpoint is placed on the left side of said central fictive viewpoint.
3. An advertisement print according to any of the claims 1-2, wherein said three-dimensional element comprises commercial information.
4. An advertisement print according to any of the claims 1-3, wherein said print carrier is a removable mat.
5. An advertisement print according to any of the claims 1-4, wherein said print carrier is a plane surface, such as a ceiling, a floor or a wall.
6. An advertisement print according to any of the claims 1-5, wherein a projector pointing towards the print carrier provides said print.
7. A method of generating an advertisement print on a print carrier, said print being a transformation of a three-dimensional element, where said

transformation is optimised for a viewer simultaneously using two viewpoints, a first viewpoint and a second viewpoint being placed on each side of said central fictive viewpoint, the method comprises the steps of:

- performing a perspective projection of the three-dimensional element to said print carrier according to said central fictive viewpoint,
- adjusting a right part of said perspective projection according to said first viewpoint,
- adjusting a left part of said perspective projection according to said second viewpoint.

8. A method according to claim 7, wherein the step of performing the projection of the three-dimensional element to the print carrier is performed by the steps of:

- generating a plane of projection being a two-dimensional image of the three-dimensional element, said plane of projection being generated in a position perpendicular to a line of sight defined between the central fictive viewpoint and the centre of said plane of projection,
- perspective projecting the plane of projection to the print carrier according to said central fictive viewpoint.

9. A method according to claim 8, wherein projecting the plane of projection to the print carrier is performed by dividing the plane of projection into a number of horizontal sub masks and then projecting each sub mask to said print carrier according to a line of sight defined between said central viewpoint and a point in said sub mask.

10. A method according to any of the claims 7-9, wherein the step of adjusting the right part of said perspective projection according to said first line of sight is performed by stretching the right side of the perspective projection towards said first line of sight and wherein the step of adjusting the left part of said perspective projection according to said second line of sight is

performed by stretching the left side of the perspective projection towards said second line of sight.

- 5 11. A method according to claim 10, wherein the stretching of the right side of the perspective projection towards said first line of sight is performed in such a way that the edges of the right side become parallel with said first line of sight and wherein the stretching of the left side of the perspective projection towards said second line of sight is performed in such a way that the edges of the left side become parallel with said second line of sight.
- 10 12. A method according to any of the claims 10-11, wherein said stretching is performed by dividing the perspective projection into a number of vertical sub masks, stretching each sub mask in the right side of the projection according to a line of sight defined between said sub mask and a first viewpoint, and
- 15 stretching each sub mask in the left side of the projection according to a line of sight defined between said sub mask and a second viewpoint.
- 20 13. A method according to any of the claims 7-12, wherein said first viewpoint is placed on the right side of said central fictive viewpoint and wherein said second viewpoint is placed on the left side of said central fictive viewpoint.
- 25 14. A method according to claim 7-13, wherein the transformation is further optimised for the viewer by graphically adjusting the contents of the advertisement print.
15. A method according to claim 14, wherein the graphical adjustment is made based on a simulation of the advertisement print on the print carrier.
- 30 16. A computer readable medium having stored therein instructions for causing a processing unit to execute the method of claim 7-13.